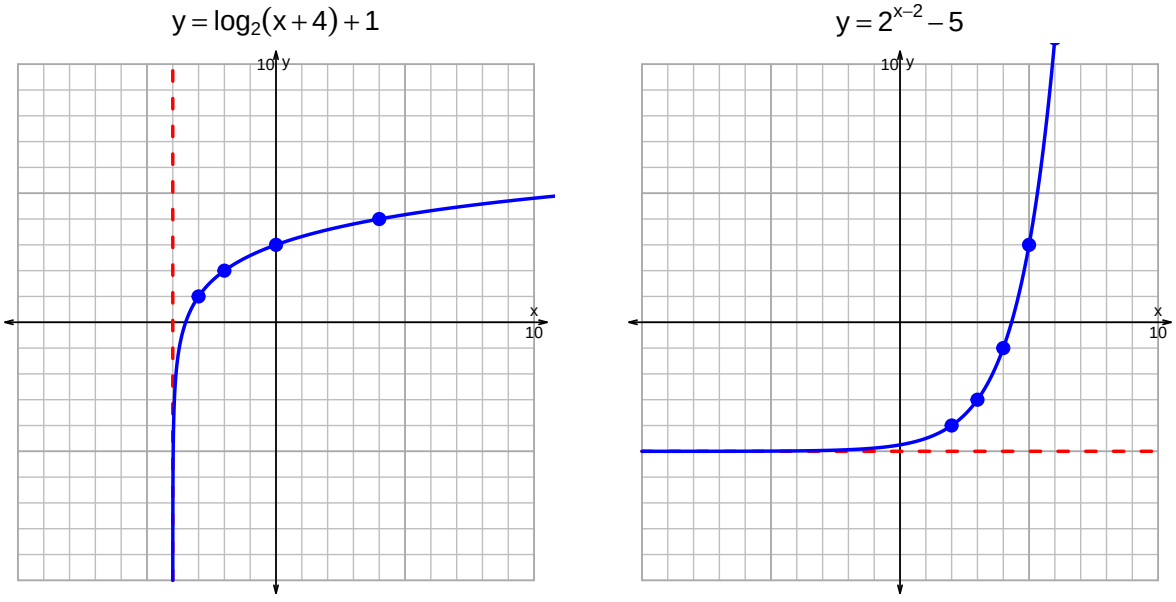
Name: Date:

s18: EXP LOG (SLTN v342)

1. (10 pts) Graph $y = \log_2(x+4)+1$ and $y = 2^{x-2}-5$ on the grids below. Also, draw any asymptotes with dashed lines.



Somewhat useful hint: $2^3 = 8$, *and thus* $\log_2(8) = 3$.

2. (10 pts) Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression. Please do not do any arithmetic; just move numbers around.

$$-17 = \left(\frac{-5}{4}\right) \cdot 2^{-3t/7}$$

Divide both sides by $\frac{-5}{4}$.

$$\frac{17 \cdot 4}{5} = 2^{-3t/7}$$

Take log, base 2, of both sides.

$$\log_2\left(\frac{17 \cdot 4}{5}\right) = \frac{-3t}{7}$$

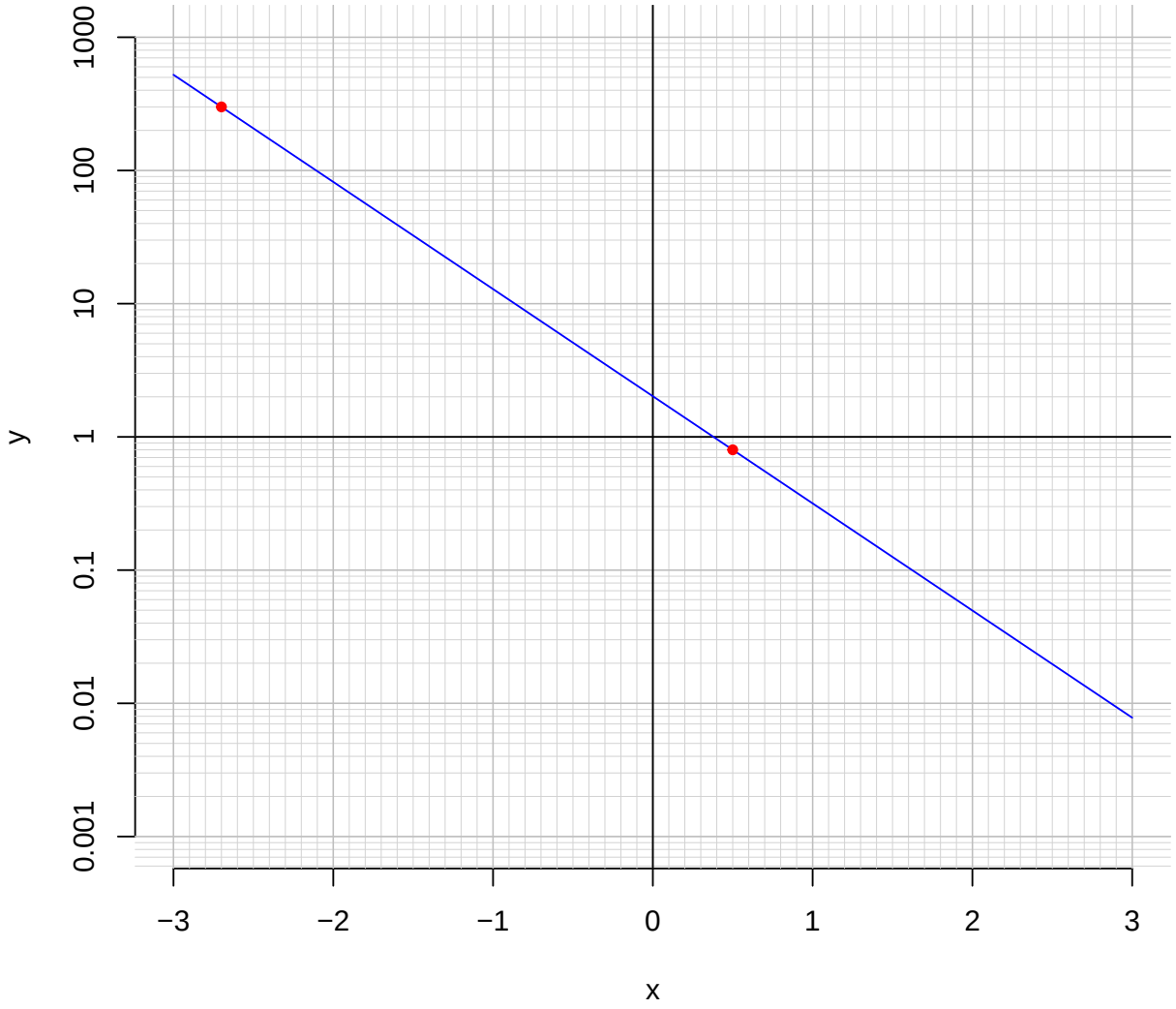
Divide both sides by $\frac{-3}{7}$.

$$\frac{-7}{3} \cdot \log_2\left(\frac{17 \cdot 4}{5}\right) = t$$

Switch sides.

$$t = \frac{-7}{3} \cdot \log_2\left(\frac{17 \cdot 4}{5}\right)$$

3. (10 pts) An exponential function $f(x) = 2.02 \cdot e^{-1.85x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(-2.7)$.

$$f(-2.7) = 300$$

b. The inverse function is logarithmic.

$$f^{-1}(x) = \frac{-1}{1.85} \cdot \ln\left(\frac{x}{2.02}\right)$$

Using the plot above, evaluate $f^{-1}(0.8)$.

$$f^{-1}(0.8) = 0.5$$